

## CLAIMS

What is claimed is:

1           1.     A method for creating an image of a source disk of a source computer, in  
2     which contents of the source disk are arranged according to at least one source file  
3     system, comprising:

4           while the source disk is in an unmodified, unprepared state, extracting the  
5     contents of the source disk and populating a destination image with the contents of the  
6     source disk such that the destination image may have a different sector-by-sector  
7     content than the source disk but a destination file system logically equivalent to the  
8     source file system.

1           2.     A method as in claim 1, in which the destination image has the identical  
2     files, attributes, and structural relationships between files as the source disk.

1           3.     A method as in claim 1, further comprising, in a server computer that  
2     includes an operating system that has file system software that automatically detects  
3     the file system of disks mounted in the server computer:

4           creating a simulated source disk corresponding to the source disk;

5           mounting the simulated source disk in the server computer, the file system  
6     software thereby automatically detecting the file system of the simulated source disk  
7     and therefore of the source disk and exposing the file system to software running on the  
8     server computer; and

9           intercepting sector-based I/O requests directed to the simulated source disk and  
10     retrieving the source disk data from the source disk according to the intercepted sector-  
11     based I/O requests.

1           4.     A method as in claim 3, further comprising forwarding the sector-based I/O  
2     requests to the source computer.

1           5.     A method as in claim 4, in which the source disk is associated with a  
2 source computer that has a memory, further comprising:  
3         loading an imaging client program in the memory of the source computer;  
4         passing the sector-based I/O requests to the imaging client, the imaging client  
5         directing the sector-based I/O requests to the source disk.

1           6.     A method as in claim 5, further comprising:  
2         loading a secondary operating system in the memory of the source computer,  
3         said secondary operating system mediating I/O requests between the imaging client  
4         and the source disk.

1           7.     A method as in claim 3, further comprising:  
2         mounting the destination image in an uninitialized state in the server computer as  
3         a simulated destination disk;  
4         intercepting sector-based I/O requests directed to the simulated destination disk  
5         and directing the contents of the intercepted I/O requests to the destination image;  
6         retrieving partition and file system layout information from the source disk;  
7         formatting the simulated destination image to have the same partitioning and file  
8         system(s) as the simulated source disk and thus of the source disk; and  
9         copying the files of at least one file system of the simulated source disk to the  
10        corresponding file system of the simulated destination disk.

1           8.     A method as in claim 7, further comprising converting the sector-based I/O  
2 requests to the simulated destination disk into sector accesses within the destination  
3 image.

1           9.     A method as in claim 7, in which the destination image is a virtual disk file  
2 associated with a virtual computer.

1           10.    A method as in claim 9, in which the source computer is a physical  
2 computer and the source disk is a physical disk associated with the physical computer.

1           11.    A method as in claim 9, in which the virtual disk file is a sparse virtual disk,  
2   having a predetermined capacity and initial sector contents with null values.

1           12.    A method as in claim 7, in which the source disk is a source virtual disk.

1           13.    A method as in claim 12, in which the destination disk is a physical disk.

1           14.    A method as in claim 7, in which the source disk is a first virtual disk  
2   associated with a first virtual computer and the destination disk is a second virtual disk  
3   associated with a second virtual computer.

1           15.    A method as in claim 7, in which the source computer is the same as the  
2   server computer.

1           16.    A method for creating an image of a source disk of a source computer, in  
2    which contents of the source disk are arranged according to at least one source file  
3    system, comprising:  
4           in a server computer that includes an operating system that has file system  
5    software that automatically detects the file system of disks mounted in the server  
6    computer, while the source disk is in an unmodified, unprepared state, extracting the  
7    contents of the source disk and populating a destination image with the contents of the  
8    source disk such that the destination image may have a different sector-by-sector  
9    content than the source disk but a destination file system logically equivalent to the  
10   source file system, with identical files, attributes, and structural relationships between  
11   files as the source disk;  
12           creating a simulated source disk corresponding to the source disk;  
13           mounting the simulated source disk in the server computer, the file system  
14   software thereby automatically detecting the file system of the simulated source disk  
15   and therefore of the source disk and exposing the file system to software running on the  
16   server computer;  
17           intercepting sector-based I/O requests directed to the simulated source disk and  
18   retrieving the source disk data from the source disk according to the intercepted sector-  
19   based I/O requests;  
20           forwarding the sector-based I/O requests to the source computer;  
21           loading an imaging client program into a memory of the source computer;  
22           passing the sector-based I/O requests to the imaging client, the imaging client  
23   directing the sector-based I/O requests to the source disk; operating system mediating  
24   I/O requests between the imaging client and the source disk;  
25           mounting the destination image in an uninitialized state in the server computer as  
26   a simulated destination disk;  
27           intercepting sector-based I/O requests directed to the simulated destination disk  
28   and directing the results of the intercepted I/O requests to the destination image;  
29           converting the sector-based I/O requests to the simulated destination disk into  
30   sector accesses within the destination image;  
31           retrieving partition and file system layout information from the source disk;

32           formatting the simulated destination image to have the same partitioning and file  
33           system(s) as the simulated source disk and thus of the source disk; and  
34           copying the files of at least one file system of the simulated source disk to the  
35           corresponding file system of the simulated destination disk.

1           17.    A system for creating an image of a source disk of a source computer, in  
2           which contents of the source disk are arranged according to at least one source file  
3           system, comprising a server computer including computer instructions  
4           while the source disk is in an unmodified, unprepared state, for extracting the  
5           contents of the source disk and populating a destination image with the contents of the  
6           source disk such that the destination image may have a different sector-by-sector  
7           content than the source disk but a destination file system logically equivalent to the  
8           source file system.

1           18.    A system as in claim 17, further comprising:  
2           a server operating system that resides in the server computer;  
3           file system drivers within server operating system automatically detecting the file  
4           system(s) of disks mounted in the server computer;  
5           an imaging server running within the server computer and comprising computer-  
6           executable instructions:  
7                 for creating a simulated source disk corresponding to the source disk;  
8                 for mounting the simulated source disk in the server computer, the file  
9           system drivers thereby automatically detecting the file system of the simulated source  
10          disk and therefore of the source disk and exposing the file system to software running  
11          on the server computer; and  
12          a network loopback driver intercepting sector-based I/O requests directed to the  
13          simulated source disk and retrieving the source disk data from the source disk  
14          according to the intercepted sector-based I/O requests.

1           19.    A system as in claim 18, further comprising a network adapter forwarding  
2           the sector-based I/O requests to the source computer.

1           20.    A system as in claim 19, further comprising:  
2           a memory within the source computer;  
3           an imaging client installed in the memory of the source computer, said imaging  
4 client comprising computer-executable instructions  
5                 for receiving any source disk I/O requests issued from the server  
6 computer to the source computer,  
7                 for directing the sector-based I/O requests to the source disk, and  
8                 for passing the retrieved source disk data to the server computer in  
9 response to the source disk I/O requests.

1           21.    A system as in claim 18, further comprising:  
2           a simulated destination disk generated by mounting the destination image in an  
3 uninitialized state in the server computer;  
4           a local loopback driver intercepting sector-based I/O requests directed to the  
5 simulated destination disk and retrieving partition and file system layout information  
6 from the source disk;  
7           a local adapter comprising computer-executable instructions for converting the  
8 sector-based I/O requests to the simulated destination disk into sector accesses within  
9 the destination image; and  
10          a formatting module comprising computer-executable instructions for formatting  
11 the destination image to have the same partitioning and file system(s) as the simulated  
12 source disk and thus of the source disk;  
13          the imaging server further comprising computer-executable instructions for  
14 copying the files of at least one file system of the simulated source disk to the  
15 corresponding file system of the simulated destination disk.

1           22.    A system as in claim 21, in which the source disk is a virtual disk.

1           23.    A system as in claim 22, in which the destination disk is a physical disk.

1           24.    A system as in claim 21, in which the destination image is a virtual disk file  
2 associated with a virtual computer.

1           25.    A system as in claim 24, in which the source computer is a physical  
2 computer and the source disk is a physical disk associated with the physical computer.

1           26.    A system as in claim 18, in which the source computer is the same as the  
2 server computer.

1           27.    A system for creating an image of a source disk of a source computer,  
2 which has a memory and in which contents of the source disk are arranged according to  
3 at least one source file system, comprising:  
4           a server computer;  
5           a server operating system that resides in the server computer;  
6           file system drivers within server operating system automatically detecting the file  
7 system(s) of disks mounted in the server computer;  
8           an imaging server running within the server computer and comprising computer-  
9 executable instructions:  
10           for extracting the contents of the source disk and populating a destination  
11 image with the contents of the source disk such that the destination image may have a  
12 different sector-by-sector content than the source disk but a destination file system  
13 logically equivalent to the source file system  
14           for creating a simulated source disk corresponding to the source disk;  
15           while the source disk is in an unmodified, unprepared state, for mounting  
16 the simulated source disk in the server computer, the file system drivers thereby  
17 automatically detecting the file system of the simulated source disk and therefore of the  
18 source disk and exposing the file system to software running on the server computer;  
19           a network loopback driver intercepting sector-based I/O requests directed to the  
20 simulated source disk;  
21           a network adapter forwarding the intercepted sector-based I/O requests to the  
22 source computer;

23           an imaging client installed in the memory of the source computer, said imaging  
24 client comprising computer-executable instructions  
25           for receiving any source disk I/O requests issued from the server  
26 computer to the source computer,  
27           for directing the sector-based I/O requests to the source disk, and  
28           for passing the retrieved source disk data to the server computer in response to  
29 the source disk I/O requests;  
30           a simulated destination disk generated by mounting the destination image in an  
31 uninitialized state in the server computer;  
32           a local loopback driver intercepting sector-based I/O requests directed to the  
33 simulated destination disk and retrieving partition and file system layout information  
34 from the source disk;  
35           a local adapter comprising computer-executable instructions for converting the  
36 sector-based I/O requests to the simulated destination disk into sector accesses within  
37 the destination image; and  
38           a formatting module comprising computer-executable instructions for formatting  
39 the destination image to have the same partitioning and file system(s) as the simulated  
40 source disk and thus of the source disk;  
41           the imaging server further comprising computer-executable instructions for  
42 copying the files of at least one file system of the simulated source disk to the  
43 corresponding file system of the simulated destination disk.